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Abstract

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Although pilots are well trained and there are rules, models and standard operating procedures to use in decision-making situations, aviation accidents do occur. One reason why accidents may occur is because pilots sometimes decide to violate, or deviate from standard operating procedures. The overall aim of the present thesis was to explore possible reasons for violating behavior. In Study I and II, cognitive and affective processes were studied in experimental designs. Study I took place in a laboratory setting where non-pilots made a choice between a sure or uncertain loss. Study II took place in naturalistic settings were car drivers and commercial airline pilots made a choice between either, comply with or violate a rule. In Study I and II participants made the choice either after reading or experience a probability distribution. The conditions were either affect-rich or affect-poor in both studies. Some support was found for underweighting of small probabilities in Study I replicating Hertwig, Baron, Weber and Erev (2004). Overall, the affect rich condition in Study I produced more random choices compared to the affect poor condition. However, no effect of probability presentation format or affect was found in the naturalistic settings of Study II. Data for Study III and IV were collected in connection with Study II. In Study III, other possible reasons for violating procedures among airline pilots were added, such as organizational, social, and individual factors. The result of Study III showed differences between violators and compliers in terms of subjective risk judgment, attitudes and, reasons for violation. In addition, it was found that the majority used experience-based decision-making. In Study IV focused turned towards individual differences in decision-making style, non-technical skills, and overconfidence as possible antecedents to violations. Decision-making styles were measured with the GDMS inventory (Scott & Bruce, 1995). Non-technical skills were measured with the NOTECHS system (Flin et al., 2005). Pilots were found to have a predominantly rational decision-making style. A relation between decision-making style and procedure violation was found were violators are less rational and more spontaneous compared to compliers. The result showed that not all NOTECHS items correlated with the decision-making styles in the expected direction. Furthermore, overconfidence about own non-technical skills were related to procedure violation. The results of Studies I-IV demonstrate that underweighting of probabilities might exist in a laboratory setting and that affect cannot be ignored. However, probabilities were not automatically used when people made decisions about whether to follow a rule or not, in naturalistic settings. Instead organizational, social, and individual factors were more important. The NOTECHS system may be thought of as reflecting systematic, analytic and normatively correct decision-making. The result from Study IV show that this is not always the case and that there might be reason to further develop the NOTECHS system. In conclusion: to take safety a step further and create a resilient system it is necessary to take both an individual and systemic viewpoint, and to acknowledge that these viewpoints may interact.

Keywords: Aviation, decision-making, violations, non-technical skills, experience, affect, overconfidence

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